



Exploring the Use of Technology in the Audit with Focus on Data Analytics

The change in motion

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25 July 2018

Today with you



Matteo Balestracci, Partner of Audit

Joined KPMG in 2001.

At KPMG, Matteo has worked with companies and groups in various industrial and service sectors, both national and multinational, mainly in audit engagements and, more generally, in global assurance activities.

Qualification

- Degree in Business Economics from Università degli Studi, Siena.
- Certified auditor and chartered accountant.
- IFRS Professional Practice.

Professional and industry experience

- Audits of separate and consolidated financial statements prepared in accordance with Italian GAAP, IFRS, HBII and US GAAP and for non-profit organisations. Main sectors: automotive, industrial and mechanic, construction, health, real estate, hotel, energy, pharmaceutical, metallurgy, communication, non-profit organisations and software development.
- Audits of listed companies and subsidiaries of listed companies both in Italy (MTA – Blue chip, Star and AIM segments) and abroad.
- Analyses of prospective data for the purposes of their inclusion in prospectuses drafted pursuant to CONSOB Issuer Regulation and for the issuing of comfort letters.
- Assessment of the adequacy of management accounting systems.
- Conversion of financial statements to International Financial Reporting Standards (IFRS).
- Due Diligence Financial Assistance in the following sectors: hotel, gaming, construction, industrial and mechanic.
- Assistance in accounting (fast closing, budgeting, job description, agreed-upon procedures, preparing consolidated financial statements).
- Preparing and attesting company and sector social and environmental reports.

Relevant engagements

- Leonardo-Finmeccanica, Knorr-Bremse, Continental, YOOX-NAP, Intek/ErgyCapital, GE O&G Nuovo Pignone, DADA, Sesa, Arcelor, UNA Hotels, Starhotels.

Languages

- Italian (native language)
- English (business level)
- Spanish (fluent written and spoken)



Diego Monteleone, Senior Manager – Information Risk Management

Joined KPMG in 2007.

At KPMG, Diego has worked with listed clients and groups in various industrial and service sectors, both national and multinational, mainly in IT Governance, IT Risks, Security and Data & Analytics services. Diego is part of the Information Risk Management department.

Qualification

- Degree in Management Engineering at Polytechnic in Torino.
- Cyber Security Nexus (CSX).
- Project Management Professional (PMP).
- Cobit 5 (A Business Framework for the Governance and Management of Enterprise IT).
- Certified Information Security Management (CISM).
- Certified Information Systems Auditor (CISA).

Professional and industry experience

- IRM in External Audit (GITCs and ITACs testing).
- Assessment of IT Environments (ISO27001/27002, NIST 800).
- Solutions for continuous audit and continuous monitoring services.
- Data & Analytics CoE coordination.
- Solution for internal Audit.
- SAP Security services.
- Social Media Security Services.

Relevant engagements

- Leonardo-Finmeccanica, YOOX-NAP, Salini Impregilo, GE O&G Nuovo Pignone, Autogrill, RCS MediaGroup, Whirlpool, Heineken, Unieuro, ABB, Atlantia, Parmalat, Vodafone.

Languages

- Italian (native language)
- English (business level)
- Portuguese (fluent written and spoken)

The Times They are a 'changin'





KPMG and the change in motion

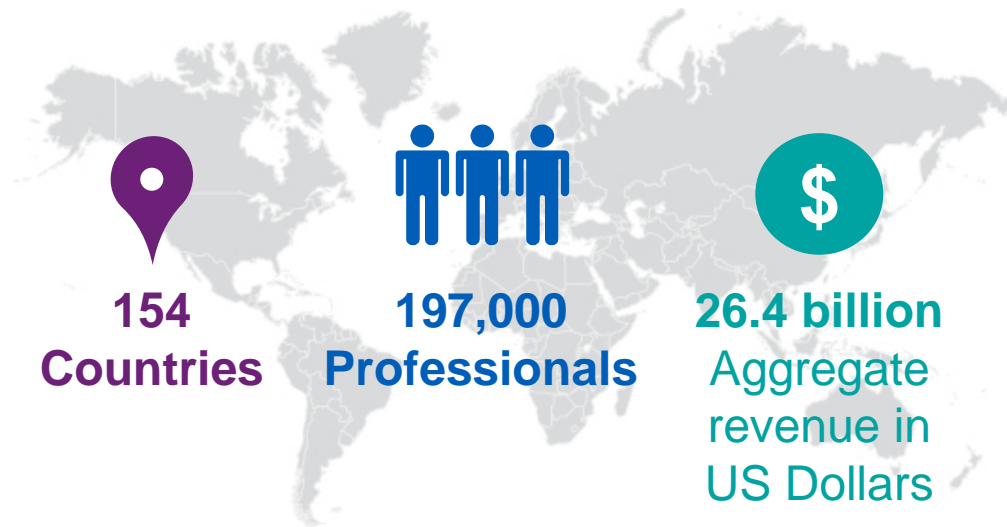


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“Global Reach – Local Knowledge”

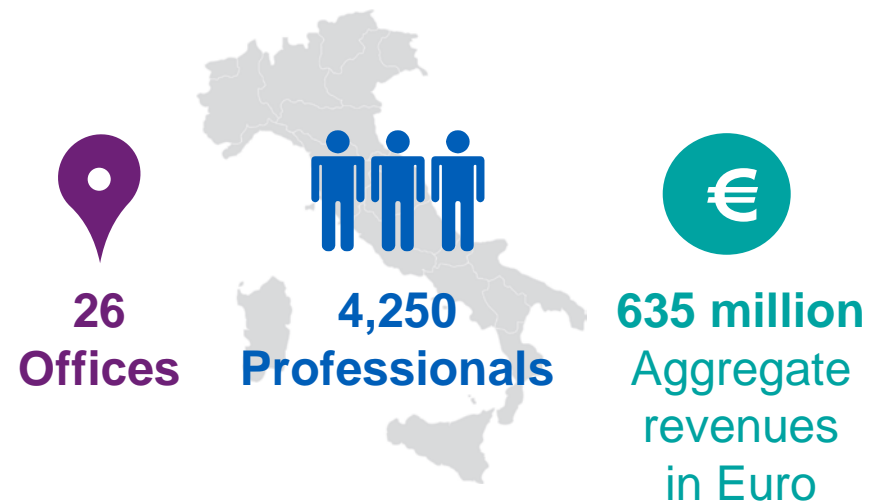
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The global Network



Combined information of the member firms of KPMG International
Source: KPMG International Annual Review 2017

The Italian Network



Combined information of the Italian KPMG entities
Source: 2017 annual reports

Network KPMG in Italy

In Italy KPMG operates through **4 entities, 26 offices** with approximately **4,250 professionals**

KPMG S.p.A.

Audit

Studio Associato

Tax & Legal

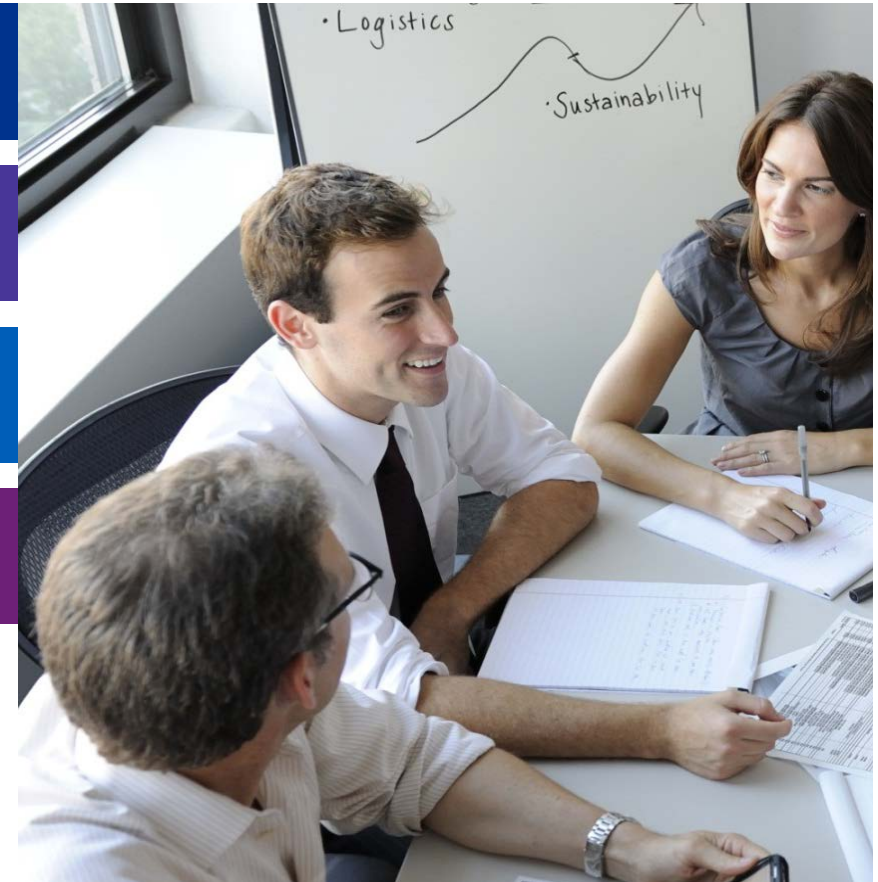
KPMG Advisory S.p.A.

Advisory Services

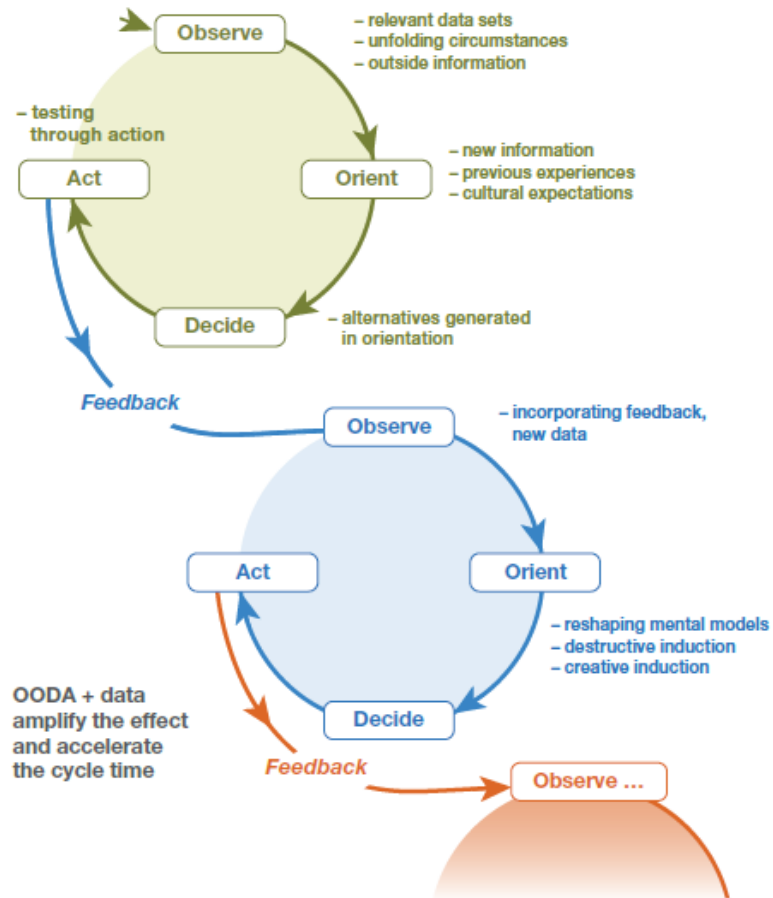
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Accounting

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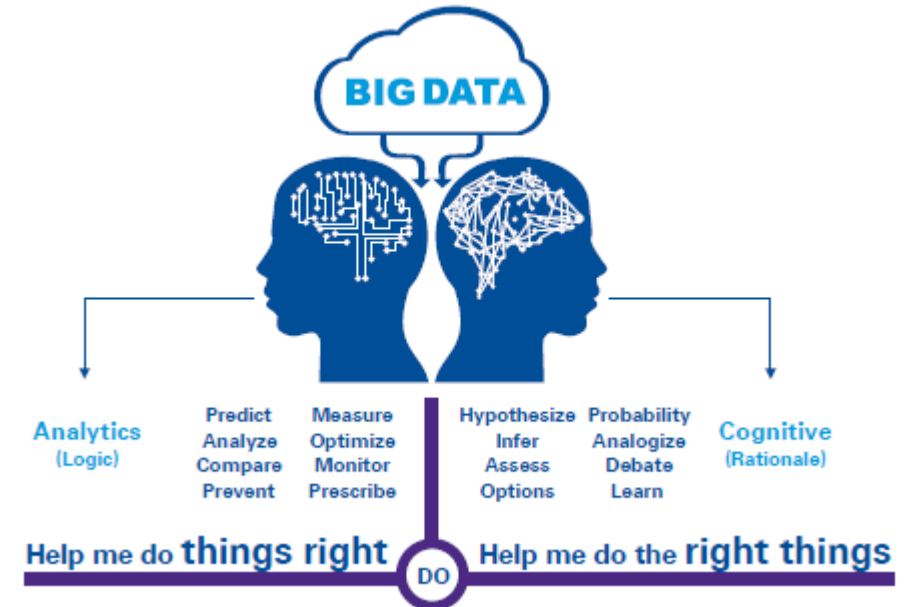


The OODA loop¹



¹ Observe, orient, decide, and act – a strategic decision-making model developed by US Air Force colonel John R. Boyd.

Best-in-class organizations continually test their assumptions, processing new information more accurately and reacting to situations more quickly.



Source: McKinsey Quarterly, Making data analytics work for you – instead of the other way around



The change in motion

The variety of stances among runners in the 100-meter sprint at the first modern Olympic Games, held in Athens in 1896, is surprising to the modern viewer. Thomas Burke (second from left) is the only runner in the crouched stance — considered best practice today—an advantage that helped him win one of his two gold medals at the Games.





Establishing the rules of a new game



IAASB publication Sept 2016

IAASB established the Data Analytics Working Group (DAWG) to inform the Board as to how and when to respond to developments in technology most effectively in the public interest. Since its inception in mid-2015, the DAWG has performed outreach with various stakeholders, including accounting firms, National Auditing Standard Setters (NSS), audit regulators and oversight authorities.

In September 2016, the Data Analytics Working Group published the document: "Exploring the Growing Use of Technology in the Audit, with a Focus on Data Analytics ⁽¹⁾"

The publication provides insights into the opportunities and challenges with the use of data analytics in the audit and outlines the insights gained from the DAWG's activities to date. The purpose of this publication is to:

- a) Inform stakeholders about the IAASB's ongoing work to explore effective and appropriate use of technology, with a focus on data analytics, in the audit of financial statements; and
- b) Obtain stakeholder input and perspectives on whether all of the considerations relevant to the use of data analytics in a financial statement audit have been identified.



⁽¹⁾ Data Analytics, hereinafter also DA



IAASB considerations over DA



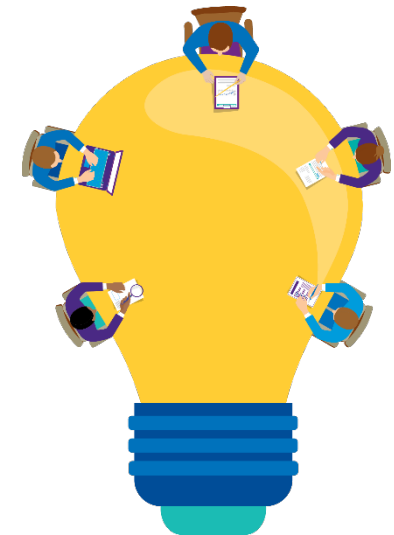
Why considering the Growing Use of D&A in the Audit?

Auditors play a key role in contributing to the credibility of the financial statements on which they are reporting. High-quality audits support financial stability. As the global auditing standard setter, the IAASB has a public interest responsibility to develop standards and guidance for auditors to facilitate high-quality audits being achieved.

In the history of the audit profession, there have been shifts in how the audit is executed. These shifts have been a result of transformations in the environment in which companies operate, and in which audits are performed. Prior to the current risk-based audit approach, companies operated in a far less complex environment. As a result, the audit was carried out in a largely manual way with a relatively high proportion of the financial information underlying the financial statements being tested without any significant emphasis on the nature and extent of the risks of material misstatement.

Over time, the risk-based audit approach has evolved—due to:

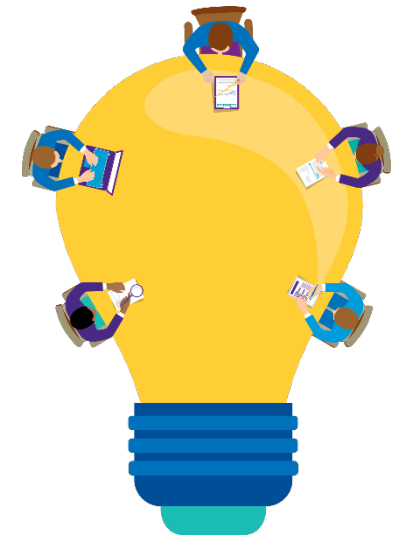
- i) higher transaction volumes such that auditors were not able to test all transactions underlying the financial statements
- ii) increased complexity
- iii) regulation stimulated by highly public failures of companies; and
- iv) technology limitations. A risk-based audit focuses on the nature and extent of risks of material misstatement for the particular engagement, with greater emphasis on obtaining an understanding of internal control established by an entity and, where appropriate, obtaining audit evidence from the auditor's testing of the effectiveness of such internal control.



Why considering the Growing Use of D&A in the Audit?

Technological change is occurring at a rapid pace, ushering in the capability to capture and communicate data digitally, on an unprecedented scale and almost instantaneously. This has resulted in an increasing focus on data, whether structured or unstructured, and whether generated internally or externally to the entity. Comprehensive and powerful digital information systems are increasingly capable of handling, analyzing, communicating and responding to these data-related changes. Companies are rapidly changing their business models in innovative ways in response to these developments.

Stakeholder expectations regarding the use of technology in the financial statement audit are evolving. Developments in technology, both within the financial reporting systems used to initiate, process, record and store data representing the information in the financial statements, and the tools and techniques available to analyze that data, are resulting in questions from stakeholders regarding how data analytics fits into the current risk based audit model. In a number of jurisdictions, particularly where proposals and re-proposals for audit are now more common, entities are inquiring of the auditor's data analytics capabilities and in some cases, expecting the auditor to perform an audit that includes the increased use of technology, particularly data analytics.

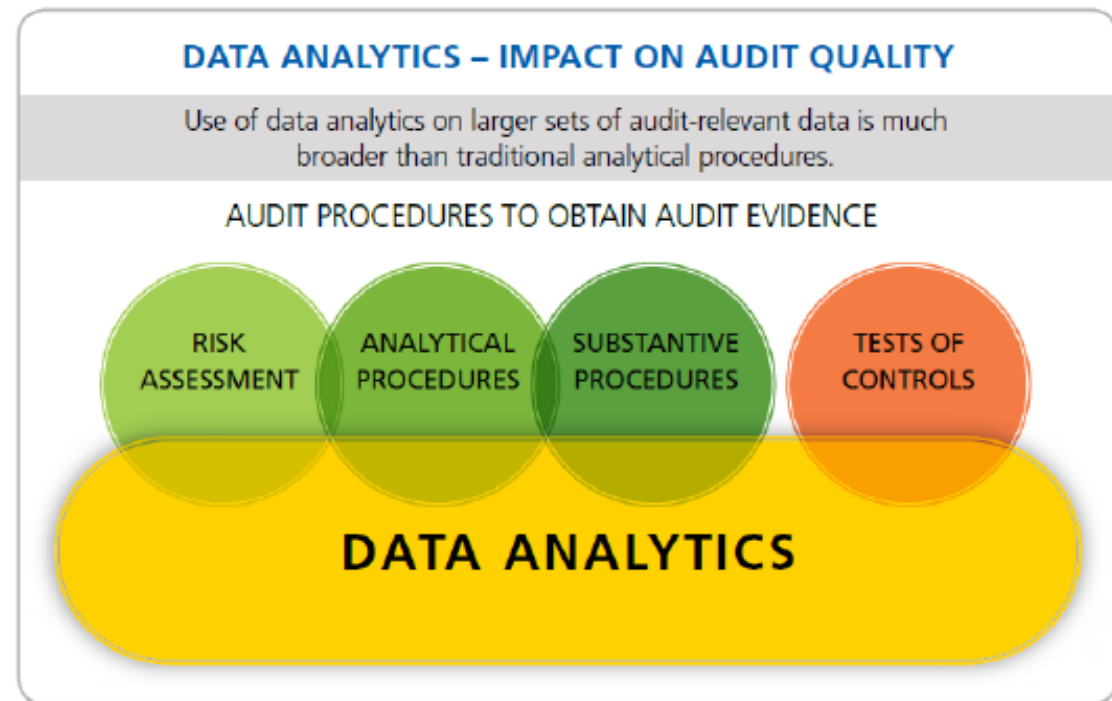


Data Analytics and the Financial Statement Audit

In an increasingly complex and high-volume data environment, the use of technology and data analytics offers opportunities for the auditor to obtain a more effective and robust understanding of the entity and its environment, enhancing the quality of the auditor's risk assessment and response.

Other benefits of the use of data analytics include:

- a) Enhancing the auditor's ability to gather audit evidence from the analysis of larger populations, including enabling better risk-based selections from those populations for further testing by the auditor.
- b) Broader and deeper auditor insight of the entity and its environment, which provides the entity being audited with additional valuable information to inform its own risk assessment and business operations.



Data Analytics and the Financial Statement Audit

Being able to test 100% of a population does not imply that the auditor is able to provide something more than a reasonable assurance opinion or that the meaning of "reasonable assurance" changes.

While the benefits are clear, there are also limitations auditors need to be aware of:

- a) Auditors need to have a clear understanding of the data they are analyzing, particularly the relevance of the data to the audit. Analysis of data that is not relevant to the audit, is not well-controlled, is unreliable or the source of which (internal or external) is not well-understood could have negative consequences to audit quality. While the analysis of relevant and reliable data provides valuable insights to the auditor, it will not provide everything the auditor needs to know.
- b) Due to the need for the auditor to exercise professional judgments in relation to accounting and auditing, as well as issues related to data completeness and validity, being able to test 100% of a population does not imply that the auditor is able to provide something more than a reasonable assurance opinion or that the meaning of "reasonable assurance" changes.
- c) In the financial statements of the majority of entities, there are significant amounts and disclosures that are accounting estimates (or that are based on accounting estimates) or that contain qualitative information. Professional judgment is necessary to assess the reasonableness of the entity's estimated value and disclosures of those items. While the data analytics technology of today is able to unlock valuable insights for the auditor to consider, its use in a financial statement audit will not replace the need for professional judgement and professional skepticism.
- d) The effective use of technology can support the auditor in obtaining sufficient and appropriate audit evidence. However, caution should be exercised regarding the auditor's and stakeholders' potential "overconfidence" in technology, in which auditors lacking a clear understanding of the uses and limitations of technology falsely believe the results to be infallible (i.e., the output must be 100% accurate because a software program produced it).



Technology and the ISAs—The Present and the Possibilities

The ISAs need to continue to be robust and relevant in a fast-developing environment. At the same time, the ISAs need to be capable of being applied to drive appropriate auditor performance regardless of the circumstances (i.e., keeping to principles rather than specifics tied to current practice). Of particular relevance to an audit are technological developments resulting in more powerful data analysis tools and techniques that can be used in procedures to obtain audit evidence. These data analysis tools and techniques provide the auditor, in an environment of increasing complexity and large populations of audit relevant data, with enhanced capabilities to more effectively and efficiently understand the entity and its environment.

Auditors have indicated that they find challenges in fitting the audit evidence derived from data analytics into the current audit evidence model within the ISAs.

Data analytics provide an opportunity to maximize the effectiveness of the human element. For example, technology solutions can reduce the amount of time dedicated to manual analysis, allowing more time to be spent by the auditor on the more judgmental aspects of an analysis. Because data analytics is able to provide the auditor with different and more informative insights, the use of data analytics improves the auditor's ability to identify relationships and inconsistencies, enhancing the auditor's judgments and ability to be appropriately skeptical. However, auditors have indicated that they find challenges in fitting the audit evidence derived from data analytics into the current audit evidence model within the ISAs.



Technology and the ISAs—The Present and the Possibilities

Auditors are considering the implications of analysis of the entity's data across 100% of a population, for example:

- a) How doing so informs the auditor's identification and assessment of the risks of material misstatement.
- b) Whether, in addition to supporting risk assessment, data analytics can be used to provide substantive audit evidence, and whether that evidence arises from what are classified in the ISAs as tests of controls, tests of detail or substantive analytical procedures.
- c) Whether the use of data analytics has an effect on evidence required from performance of other substantive audit procedures or tests of controls.

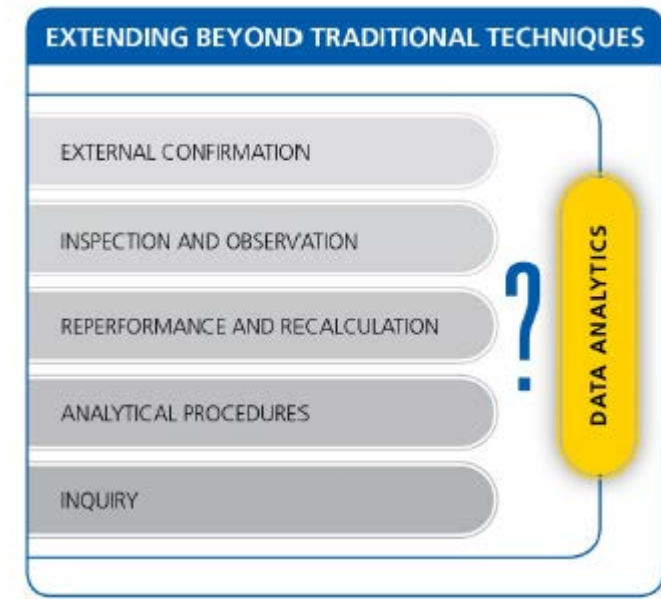


Let's Move Forward with Making Changes to the ISAs?

Technological advancements and developments in data analytics challenge everyone and giving serious consideration to the possibilities requires vision. The ISAs were written in a completely different technological era. While the ISAs are not that old, there have been rapid changes in technological advancements in recent years, the breadth and scale of which was not and probably could not have been reasonably anticipated at the time that many of the ISAs were developed or revised. Some hold the view that the current environment of fast-paced change and the expectation of ongoing evolution create a compelling platform for revisiting fundamental questions such as what the audit could or should be, including exploring whether there is a need to possibly start with a blank sheet of paper as attempting to retrofit data analytics into the ISAs today is likely not an effective approach.

The ISAs do not prohibit the use of data analytics techniques. However, the lack of reference to data analytics beyond mention of traditional CAATs in the ISAs may be viewed as a barrier to their adoption more broadly.

This lack of reference to data analytics in the ISAs also results in some being of the view that gathering information from the use of data analytics does not necessarily reduce the procedures required by the ISAs today, even if those required procedures now appear redundant as a result of the information gained from the use of data analytics.



Let's Move Forward with Making Changes to the ISAs?

Should the ISAs specifically acknowledge the possibility of obtaining audit evidence from data analytics? In a regulatory environment where auditors are being innovative with the use of developments in technology to enhance audit quality and the effectiveness and efficiency of their audits, they are having to be courageous in new ways of auditing without the support of the auditing literature. In some jurisdictions, increased use of technology and data in the audit are being demanded by the marketplace. Investors too have noted that, while the auditing standards are not broken, they need to reflect current practices and developments in order to remain relevant and meet investor expectations of the effective use of technology by the auditor to deliver high-quality audits. There is a risk associated with the use of new and innovative techniques for which there is not a strong framework within the standards. Challenges result for audit oversight authorities when performing audit inspections. Auditors are faced with the increased risk of getting second guessed on inspection and not having a clear basis in the auditing standards to substantiate the judgments made and procedures performed. This may deter auditors from using and experimenting with data analytics. There is also a risk that views of audit oversight authorities might evolve in an inconsistent manner—within and between jurisdictions.

Auditors, audit oversight authorities, standard setters and other stakeholders need to work together in exploring how developments occurring in technology could support enhanced audit quality.



Let's Move Forward with Making Changes to the ISAs?

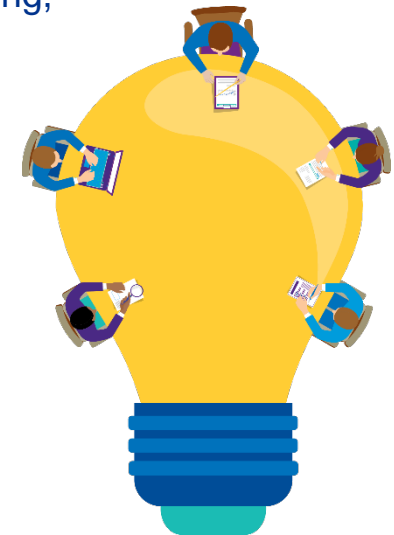
There are very likely opportunities for the ISAs to be revised to address technological advancements and data analytics. Auditors and audit oversight authorities are looking to standard setters, such as the IAASB, to act in this area. Auditing standards should foster enhanced audit quality. At the same time, auditing standards should also be able to accommodate developments (such as technology advancements) that occur in the future, without needing to be in a continual state of change. While significant technological developments have occurred to date, including in the area of data analytics, further development and analysis (such as academic research) is anticipated in the near future.



Optimism – But There Are Still Unanswered Questions

Challenges Posed by Environmental Factors and Circumstances in the Business Environment

- a) **Data acquisition** – including challenges with access to the large data sets that are needed to effectively execute certain types of data analytics. In most instances, the entity's data needs to be transferred to the auditor and, in addition to concerns related to data security and privacy, having sufficient infrastructure to store and then process the data can be challenging due to the size and volume of data.
- b) **Conceptual challenges** – when performing an audit that involves data analytics, the engagement team may be requesting data from the entity and asking questions about that data that have not been asked in the past. The approach to certain areas of the audit where data analytics is utilized is also quite different to what the entity may be used to seeing, and the entity may be hesitant to provide all of the data being requested.
- c) **Legal and regulatory challenges** – these include concerns regarding data security and privacy, but also jurisdictional law and regulation that, in some cases, prohibits data from leaving the jurisdiction within which the entity is located. This can be particularly challenging when the auditor needs to transfer the data to information technology (IT) facilities that may be located outside of the jurisdiction of the entity.
- d) **Resource availability** – a model that may be used by auditors utilizing data analytics in the audit may require skilled centralized resources supporting engagement teams. These skilled centralized resources are often data scientists and, as the extent of use of data analytics in the audit grows, strain is put on the resources currently available.



Optimism – But There Are Still Unanswered Questions

Challenges Posed by Environmental Factors and Circumstances in the Business Environment

- e) **How regulators and audit oversight authorities maintain oversight** in a rapidly changing area when the audit oversight authorities have little experience themselves of inspecting audits where the auditor has made use of data analytics and other technology innovations.
- f) **The investment in re-training and re-skilling auditors** that over time have acquired knowledge, skills and experience in traditional ways of auditing that have been around for a long time is a challenge for the profession. From the most experienced to the least experienced auditor, and from the largest accounting firms to the smallest, changing the auditor's mindset to gathering audit evidence from the use of data analytics compared to traditional techniques will require time and investment in training.



Optimism – But There Are Still Unanswered Questions

Challenges Encountered by Auditors that May Affect Audit Standard Setting

- a) **General IT controls.** Data analysis triggers more questions regarding general IT controls and application controls, particularly:
 - i) What is the minimum level of general IT controls testing, and the impact of the results of that testing, when the auditor is using data analytics in the audit; and
 - ii) The impact of any deficiencies in general IT controls and application controls upon which the auditor intends to rely in order to conclude that the data from the IT system is sufficiently reliable for the auditor's purpose.
- b) Audit procedures when the majority of data utilized is **information produced by the entity**. The ISAs require the auditor to evaluate whether the information is sufficiently reliable for the auditor's purposes, which includes, as necessary in the circumstances:
 - i) Obtaining audit evidence about the accuracy and completeness of the information; and
 - ii) Evaluating whether the information is sufficiently precise and detailed for the auditor's purposes.

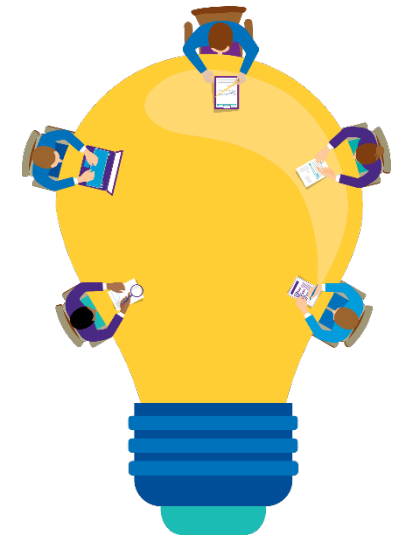
In an audit using data analytics, where much or the majority of the data utilized is produced by the entity, what procedures should the auditor be expected to perform to satisfy the requirements in the ISAs noted above? Considering the nature of the data being utilized, the ISAs could be expanded to provide greater specificity and guidance to auditors.



Optimism – But There Are Still Unanswered Questions

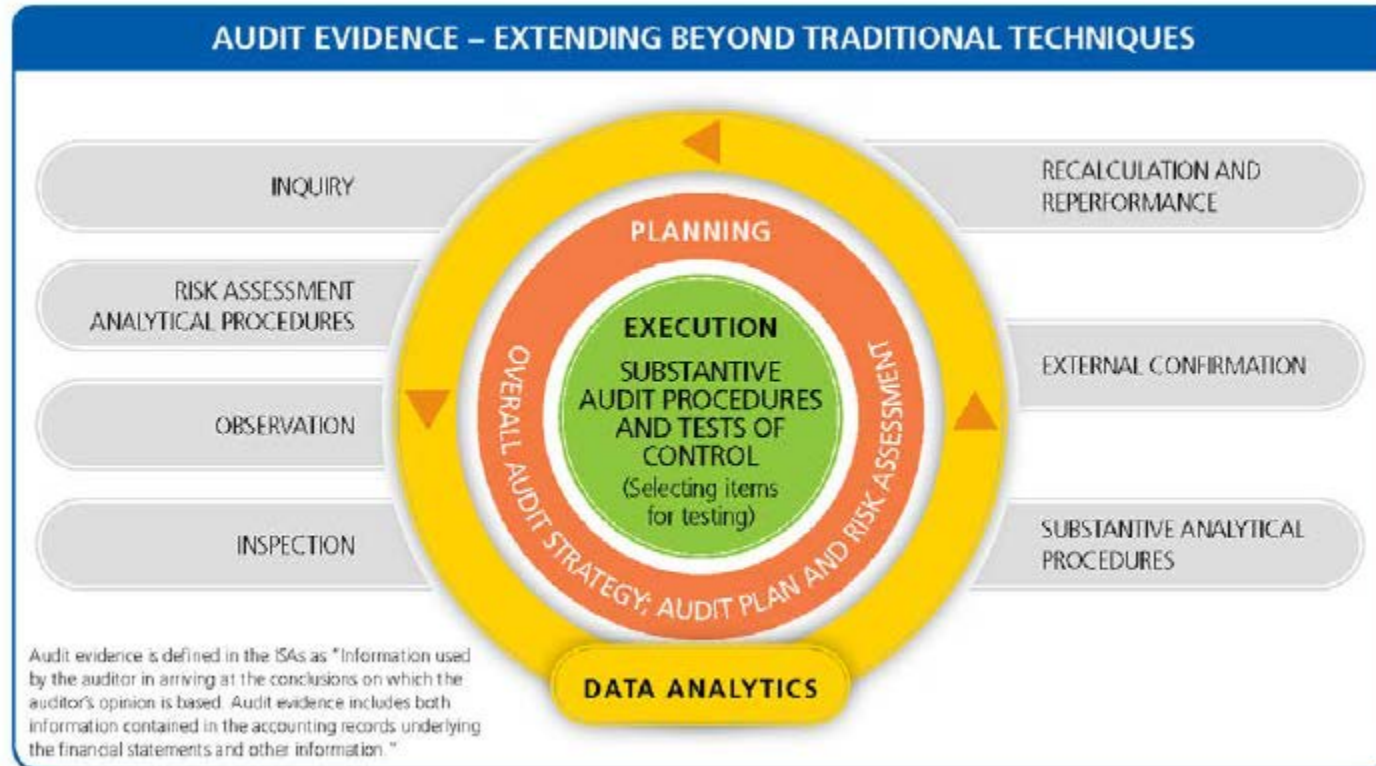
Challenges Encountered by Auditors that May Affect Audit Standard Setting

- c) **Considering the relevance and reliability of external data.** The auditor cannot assume that data from third-party sources is complete and accurate. External data obtained from third-party data providers may only be an aggregation of data obtained from multiple sources and may not have been subject to procedures to validate completeness, accuracy and reliability of data that is needed in an external audit context. The question for standard setters becomes what procedures does the auditor need to perform to meet the existing requirements in the ISAs to consider the relevance and reliability of the information to be used as audit evidence? How is this different from the premise in the extant ISAs that the reliability of audit evidence is increased when it is obtained from independent sources outside of the entity?
- d) **What is the nature of the audit evidence** obtained via data analytics when initially used as a **risk assessment** procedure (keeping in mind that the ISAs currently state that audit evidence from risk assessment procedures by themselves do not provide sufficient appropriate audit evidence on which to base the opinion)? When using data analytics for purposes of informing the auditor's risk assessment, the auditor does not develop an expectation of results. Audit evidence obtained from using data analytics for risk assessment could also be useful in other respects—but under the current requirements in the ISAs, this would not be considered audit evidence from a substantive analytical procedure as the auditor did not establish an expectation of the results at the outset of executing the analysis). Should the ISAs address when audit evidence obtained from data analytics alone would be considered sufficient appropriate audit evidence?



Optimism – But There Are Still Unanswered Questions

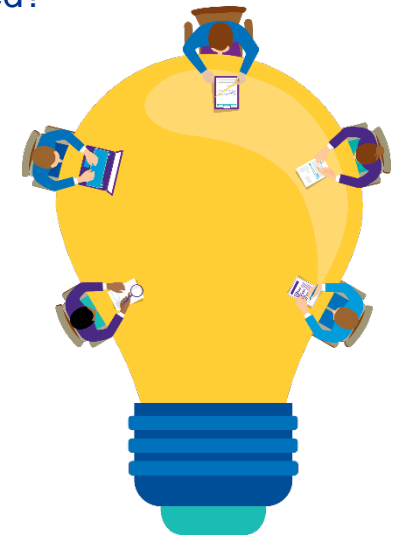
Challenges Encountered by Auditors that May Affect Audit Standard Setting



Optimism – But There Are Still Unanswered Questions

Challenges Encountered by Auditors that May Affect Audit Standard Setting

- e) **In the current risk and response nature of the ISAs**, how does an engagement team classify the audit evidence provided by data analytics? Is the difference between risk assessment procedures, tests of controls and substantive procedures relevant in an audit using data analytics, or should the ISAs be clear into which of those categories data analytics fits? What is the role of controls testing when auditors analyze 100% of the transactions in a particular area of the audit? Should the sometimes iterative nature of data analytics be reflected in the ISAs? Or is there perhaps another category of audit evidence generated from data analytics?
- f) **What is the nature of the audit evidence** obtained via data analytics in **responding to risks** identified? The structure of the ISAs requires an identification of risk of material misstatement and a response to the assessed risks. The use of data analytics does not negate that model but changes the way it is implemented—such that risk identification and response occurs in one step rather than a specific outcome of two separate activities. How does the auditor document how the objectives of the ISAs were met based on the current ISA requirements?



Optimism – But There Are Still Unanswered Questions

Challenges Encountered by Auditors that May Affect Audit Standard Setting

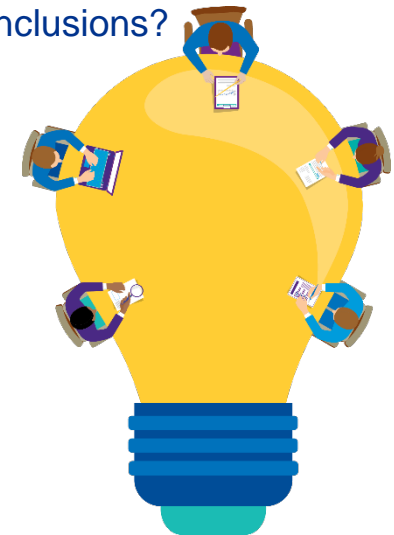
- g) **What is an appropriate level of work effort for exceptions identified?** Under the current risk-based audit approach, exceptions identified from sampling populations for testing are extrapolated to estimate the impact on the financial statements as a whole. With data analytics, when the auditor has the ability to cover a significantly larger portion of the population (in some cases 100% of the population) and to more accurately estimate the magnitude of the error (in some cases determine the worst possible case of the error), there is uncertainty regarding the extent of the auditor's work effort on outliers identified to determine whether they are in fact exceptions. There may be a high number of outliers identified from the auditor's data analytic procedure, so does the auditor need to test each outlier to confirm whether it is in fact an exception, or can the auditor perform tests of detail on a sample of the outliers and project the extent of the error based on the results of the auditor's testing of that sample? Or, should the auditor be required to perform tests of detail on each of the identified outliers until the unconfirmed amount of outliers is reduced to an amount that would not be considered quantitatively material? In addition, questions remain regarding the level of work effort to substantiate that the auditor has sufficient appropriate audit evidence with respect to the portion of the population where no exceptions were identified.
- h) **Risk measurement** – Using data analytics, the auditor can more effectively and efficiently analyze larger populations of data to inform the auditor's risk assessment. What does the implication of being able to measure the risk for a particular assertion or portion thereof more precisely have on the audit? When the auditor has been able to analyze all transactions in a particular area of the audit for the entire period under audit, what does the auditor need to do to demonstrate or corroborate that unexpected transactions have been adequately addressed in the audit?



Optimism – But There Are Still Unanswered Questions

Challenges Encountered by Auditors that May Affect Audit Standard Setting

- i) **Challenges in applying the documentation requirements when applying data analytics.** The ISAs do not currently require the auditor to retain all of the information used in selecting items to test, but require the auditor to document the identifying characteristics of the specific items or matter tested. The documentation requirements need not be any different when making use of data analytics. However, there are challenges in how the documentation requirements are applied, including those related to direction, supervision, performance and review, when using data analytics based on the iterative nature of the process to reach a conclusion. Does the engagement team need to include in the audit documentation all of the data and details of all of the routines that have been executed? What is the auditor's responsibility to retain data that was used in the performance of data analytics but that is not directly audit evidence on which the auditor has based conclusions?
- j) **The importance of auditors establishing quality control processes** over the development of data analytics technology and tools used in an audit and related audit methodology—whether this is at the accounting firm level for firm-wide techniques or at the engagement level for custom built analysis. If an auditor makes use of third-party developed data analytics technology and tools, should the auditor be expected to assess the reliability of the technology and tools utilized and, if so, to what extent must this be done?





Open points for stakeholders



Request for Stakeholder Input

The IAASB and the DAWG required to stakeholders their input on the following questions.

- a) Have we considered all circumstances and factors that exist in the current business environment that impact the use of data analytics in a financial statement audit?
- b) Is our list of standard-setting challenges accurate and complete?
- c) To assist the DAWG in its ongoing work, what are your views on possible solutions to the standard-setting challenges?
- d) Is the DAWG's planned involvement in the IAASB projects currently underway appropriate?
- e) Beyond those initiatives noted in the *Additional Resources* section of this publication, are there other initiatives of which we are not currently aware of that could further inform the DAWG's work?
- f) In your view, what should the IAASB's and DAWG's next steps be? For example, actions the IAASB and DAWG are currently considering include:
 - i) Focusing attention on revisions, where appropriate, to ISAs affected by the IAASB's current projects.
 - ii) Exploring revisions to ISA 520.2
 - iii) Hosting one or more conferences with interested stakeholders to collectively explore issues and possible solutions to the identified challenges.
 - iv) Continuing with outreach and exploration of issues associated with the use of data analytics in a financial statement audit, with a view towards a formal Discussion Paper consultation in advance of any formal standard-setting activities.





The KPMG view



The new era

In recent years we have witnessed **the birth of the information age**, with an exponential increase in the amount of data being generated, digitised and stored, along with rapid advances in the performance and sophistication of computer hardware and software. **The existence of deeper and richer pools of data, and the emergence of technologies that enable the analysis of data in ways that were not previously possible, present a compelling case for further integration of technology into the audit.** As practitioners, we continue to make significant investments to develop Data Analytics (“DA”) and other software audit tools, in the belief that they can significantly enhance audit quality and provide greater insights to both the auditor and management.

Aside from the audit, **we note that the growing use of technology by management presents similar opportunities and challenges for business.** We expect the use of technology by business to expand dramatically as technologies such as data analytics are embedded into decision making and financial reporting processes, as well as the internal control environment.

This will inevitably impact on the way an audit is conducted in the future.



Impact on audit

Our expectation is that the above trends will have a major and ongoing impact on the audit profession, including:

- the learning agenda and skillset requirements for auditors
- the quality, depth and precision of risk assessment, including fraud risk
- the nature, quantity and sources of data analysed to generate audit evidence
- the degree of automation in the audit, including judgmental areas
- the nature and extent of audit testing that is performed centrally/remotely
- the number and value of “outliers/exceptions” identified in testing and the way they are addressed
- the extent of reliance that auditors place on:
 - their firm’s policies and processes (accreditation, training, testing of tools)
 - the work of specialists; and
- the nature and extent of reliance that auditors place on technology used by others (e.g. management or component/predecessor auditors).



The Way Forward

Depending on the nature of the challenge, we expect that the appropriate response will likely require one or a combination of:

- discussion and knowledge sharing among standard setters, practitioners and regulators to develop a consensus or establish positions
- guidance on the interpretation and application of ISAs to the use of technology in the audit (perhaps in the form of an IAPN);
- new or amended auditing standards to address and perhaps encourage the use of technology currently not envisaged by the standards.



The KPMG Proposal

Our proposal is for the IAASB **to establish a resource group** consisting of IAASB representatives (e.g. DA working group and staff), audit firms, regulators and other interested parties (e.g. other national standard setters). Similar to the resource groups established by the International Accounting Standards Board to support the implementation of financial reporting standards such as IFRS 9 and IFRS 15, the DA resource group could convene regularly to:

- **provide a forum for stakeholders to learn from each other about the interpretation and application of ISAs in a DA environment**
- **identify, prioritise, analyse and propose potential solutions to issues arising from the interpretation and application of ISAs in a DA environment; and**
- **inform the IAASB about interpretation and application issues to enable the IAASB to determine what, if any, action is needed from a standard setting or guidance perspective.**

To be effective, the DA resource group would likely require **a significant time commitment** from its members. The membership might also need to evolve over time as the nature of the challenges the group focuses on changes (i.e. different specialisms may be needed). It is possible that the IAASB's Data Analytics Project Advisory Panel ("the Panel") could fulfil the role of the resource group as outlined above, provided the Panel meets with sufficient frequency to identify, prioritise, discuss and provide **input for solutions to the key challenges**, and the Panel releases summaries of these meetings (either to a broader population of stakeholders or by making them publicly available).



The KPMG Proposal

In addition to contributing to the IAASB's work on DA, we believe the benefits of the approach outlined above would include:

- promoting consistency and clarity in interpreting and applying ISAs in a DA environment by providing insights on practical solutions to areas where currently the standards are silent, require significant interpretation or appear to inhibit the use of certain technology solutions
- enabling stakeholders to obtain a more timely, albeit non-authoritative, insight into contentious issues and possible responses, compared to a more lengthy standard-setting
- providing an opportunity for practitioners to share experience gained from using DA tools and to discuss the conceptual challenges they encounter in practice;
- increasing user confidence in DA through regulator participation in the discussions, and better insight for the regulators into the way auditors use DA;
- encouraging and not inhibiting innovation (which may happen if changes to standards are made prematurely) when challenges are likely to continue to emerge and evolve;
- having an ongoing process, rather than a one-off solution, which can better respond to future technological developments;
- providing insight to audit committees/those charged with governance with respect to the changes the standards are undergoing and how that may affect the audit, as well as a better understanding of the benefits and costs of using DA in the audit.



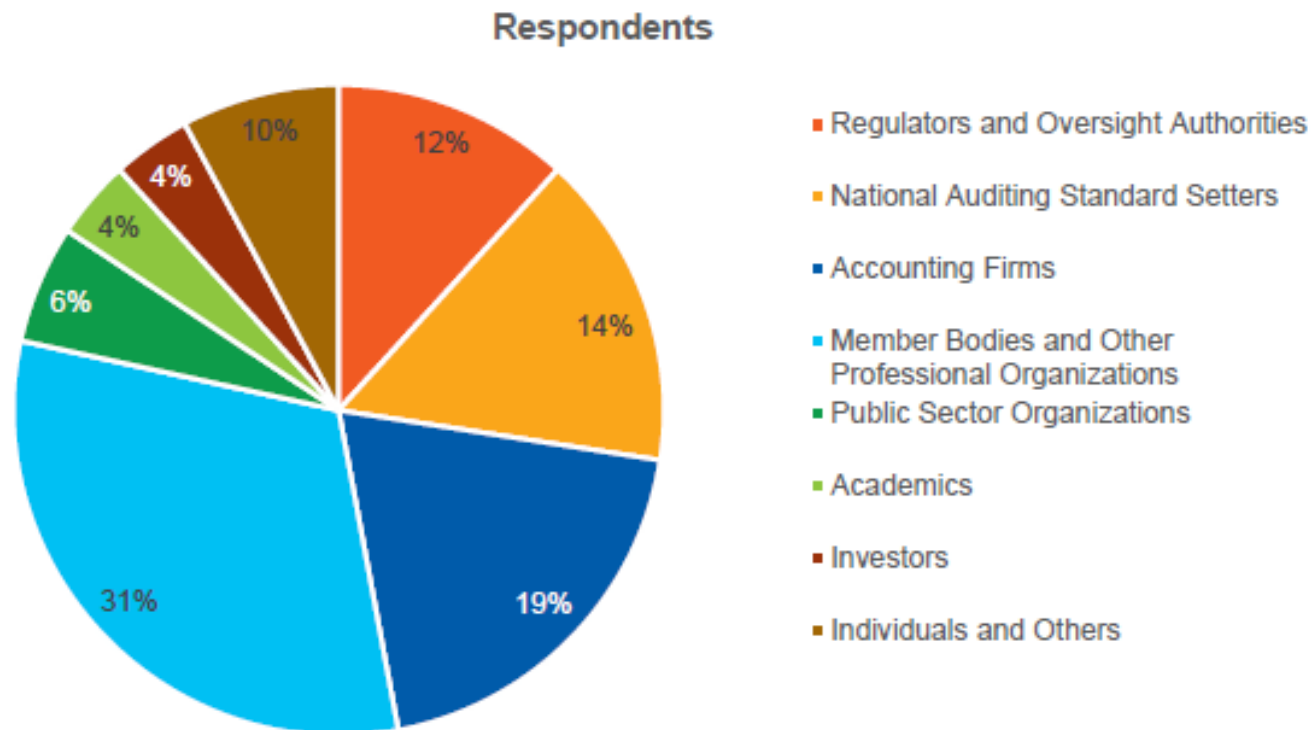


Feedback Statement Prepared by IAASB



Overview of Respondents

The comment period closed on 15 February 2017, with 51 responses received from a broad range of stakeholders across a wide range of jurisdictions.



The Feedbacks

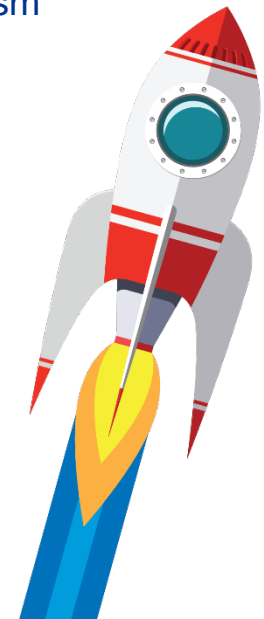
Respondents expressed **strong support for the work of DAWG**, praising both the summary of the current data analytics landscape and its role in developing consensus around key issues and contributing to the improvement of audit quality.

The **ISAs aren't "broken" and should remain principles-based**, but need to reflect the digital era in application guidance. Respondents overwhelmingly described a strong desire for **practical guidance** on the use of data analytics technology. Most respondents believe that the principles in the extant ISAs are still appropriate and accommodate the use of data analytics, and caution against prematurely rushing to change requirements in the standards.

Applying Professional Skepticism when using data analytics remains paramount, as professional skepticism is integral to understanding the benefits and limitations of data analytics in view of its intended use in the audit

"The principles in the extant ISAs are still appropriate. The challenges relating to the use of data analytics could be addressed by building on the principles already contained in the ISAs and adapting and expanding these to address new tools that have emerged as a result of evolving technology."

(South African Institute of Chartered Accountants)



The Feedbacks

It was emphasized by accounting firms that they are investing heavily in data analytic technology and thus consider the work of the DAWG both timely and relevant. Respondents generally view the DAWG as a catalyst to develop consensus around key issues, whose work will contribute to the improvement of audit quality.

Respondents also emphasized the importance of exercising professional skepticism when using data analytics, including making the link to the procedures performed, the nature of the evidence obtained and consideration about the outputs from procedures being performed using data analytics.

“The auditor should, among other things, understand the benefits and limits of the data analytics tools in view of its intended use in the audit; exercise professional skepticism when using data analytics or other technologies; ...”

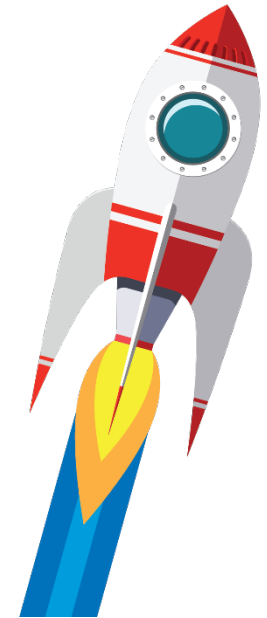
(International Forum of Independent Audit Regulators)

“The importance of professional judgement, professional skepticism and critical thinking should be continued to be emphasized, as these are integral in determining the appropriate data to use, the procedures to perform, the relevance to the audit, the nature of audit evidence, and evaluation of the results of data analytic procedures.”

(Australian Auditing and Assurance Standards Board)

“ We emphasise the importance of the continued application of auditor professional skepticism and professional judgments which should not be replaced by the use of data analytics.”

(International Association of Insurance Supervisors)



Environmental Factors Impacting the use of DA in Audit

Regulators and oversight authorities and national auditing standard setters were most concerned with issues of data acquisition and auditor skills, noting that the source and quality of the data remained a key consideration. It was also noted that audit clients may be hesitant to provide access to live operational systems, and therefore that the results of the data analytics procedures undertaken are only as reliable as the data upon which the results are based.

Accounting firms shared the concerns noted in the RFI about re-training and re-skilling auditors. Many respondents believed this challenge applies to a broader audience; for example, it was noted that regulators and audit committees would need the ability to understand the data analytics performed as part of assessing the work of the auditor. Accordingly it would be likely that collaboration with universities and other educational institutions, including those providing continuing professional education, would also be necessary.

Respondents from accounting firms highlighted concerns about regulators and oversight authorities maintaining oversight in a rapidly changing area, when these authorities have little experience themselves of inspecting audits involving the use of data analytics and other technology innovations. Accounting firms identified a reluctance to embrace data analytics because of the concern that regulators may have different interpretations on how audit standard objectives are met. For example, one respondent is aware of situations in which auditors used data analytics on 100% of a population, but also believed it necessary to perform sampling procedures on the same population to meet the requirements of the ISAs. Firms also noted that data analytic technology and tools are likely to be developed globally at the accounting firm or network level. As a result, a consistent approach to oversight may be challenging.

"The RFI recognizes the importance of practitioners establishing quality control processes over the development of data analytics technology. Regulators may wish to scrutinize these processes during their inspections and this may pose particular challenges when tools are developed centrally or globally and the quality control processes are in different jurisdictions."

KPMG

Audit Standard-Setting Challenges

All of the respondents expressed agreement with the challenges identified in the RFI.

Regulators and oversight authorities highlighted the biggest challenge as relating to the determination of whether the requirements of the ISAs have been met. These respondents were particularly concerned with how audit evidence provided by data analytics is demonstrated within the existing audit model, in particular in applying the documentation requirements.

National auditing standard setters emphasized the challenge of considering the relevance and reliability of data, whether internally generated or external to the entity, and determining the appropriate level of work effort for exceptions identified.

"In particular, test of controls is one area where we perceive it to be more difficult to apply data analytics."
UK Financial Reporting Council

Other possible challenges identified by respondents included:

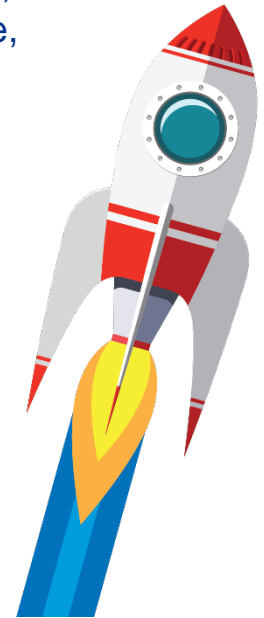
- How stakeholder expectations are managed in relation to the procedures undertaken, for example, reference to “100% testing” may be misleading in some instances. The impact of other emerging and evolving technologies, such as block chain.
- Differences in the audit approach (or quality control processes) when using internally developed data analytics tools versus third-party tools.
- The impact on the audit when the client integrates data analytics in its control environment.
- How the concept of performance materiality applies when designing data analytic audit procedures.
- Ethical requirements; for example, the implications when the client integrates its own or the auditor’s data analytic technology or tools in its control environment.

The Standard-Setting Path Ahead

Respondents offered a variety of suggestions for possible ways to meet the challenges described in the RFI. While some suggested that changes to the standards may be needed, most cautioned against rushing to change the requirements in the standards. Many respondents urged that the standards should remain principles-based, believing that provides the flexibility necessary to accommodate the rapid pace of technological change.

Most respondents identified guidance in using data analytics to meet the requirements of the ISAs as one possible solution to the standard-setting challenges. Practical guidance is widely seen as the best way in the short-term to address the challenge that, while the current standards do not prohibit the use of data analytics, they do not encourage the use of innovative, technology-enabled procedures. It was noted that as compared to revising standards, non-authoritative guidance, with real-life examples, can be produced more quickly.

Specific suggestions from respondent groups for possible solutions were also provided. A key suggestion included having the International Accounting Education Standards Board's (IAESB) International Accounting Education Standards address the perceived skills gap in data analytics among auditors.



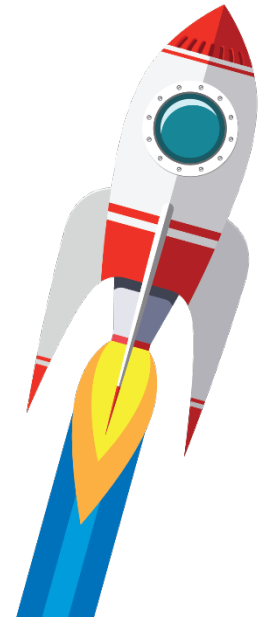
The Standard-Setting Path Ahead

Regulators and oversight authorities also provided insights as to matters of importance to consider as revisions are made to the standards, including:

- Retaining the risk-based approach in the ISAs.
- Revising the standards in a way that reflects current technology, yet remains technologically neutral and provides the ability to adapt to and accommodate changes in technology.
- Clarifying when data analytics may be appropriate in all standards for which the issue is relevant.
- Considering the implications for audits in which data analytics are not being applied.
- Clarifying that when data analytic procedures are applied, documentation should be sufficient for a knowledgeable third party to understand and support the conclusion reached.

National auditing standard setters urged continued engagement with stakeholders, specifically auditors already utilizing data analytics, data analytic specialists and data scientists, and software developers.

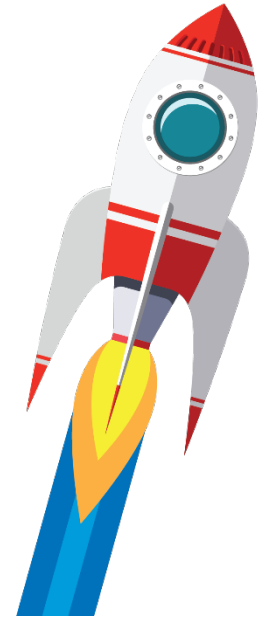
Public sector organizations repeated the themes expressed by other respondents, such as keeping the standards technologically neutral. Some public-sector organizations urged caution against developing premature solutions; one noted that it is “early days for solutions” and the “emphasis... should be on observing the responses of practitioners to these challenges.”



The Standard-Setting Path Ahead

Member bodies echoed the call for guidance on the use of audit data analytics, and the need for auditing standards to remain principles-based and sufficiently flexible and adaptable in a changing business environment. Some suggested engaging in the work of others in various projects relating to data analytics (for example the AICPA). As with other groups of respondents, comments regarding changing standards spoke to the balance required between obtaining sufficient information to revise well-established requirements and having an excess of caution that hinders innovation.

Academics noted that active communication between accounting firms, academic institutions, regulators, DAWG, and other standard-setters is essential, so that the standards reflect current practice and developments. Individuals and others who responded also stated that priority should be given to developing non-authoritative guidance and emphasized the importance of training of auditors. Some respondents believe that currently, auditors tend to have an insufficient understanding of IT to be able to come up with relevant and effective audit procedures using data analytics.

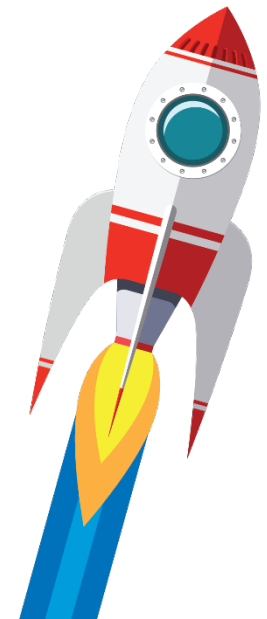


The Way Forward

The importance of the use of data analytics in a financial statement audit has been recognized by the IAASB and its stakeholders.

The DAWG is committed to exploring and understanding how the use of technology and more specifically, data analytics, can enhance audit quality, and to articulating this clearly for stakeholders. Firstly, the DAWG will continue inputting to current IAASB projects through its interaction with current IAASB project task forces and working groups, so that the IAASB's standards, as they are developed and revised, will appropriately incorporate more up-to-date considerations relevant to the use of data analytics in current and future financial statement audits. As the IAASB commences its work on audit evidence (incorporating further consideration of data analytics in the ISAs) The IAASB will also continue to monitor the activity of the AICPA Audit Evidence Task Force and consider the implications for potential revisions to ISA 500. (Note that this monitoring will be facilitated by the fact that the chair of the DAWG is also chair of the AICPA Audit Evidence Task Force.)

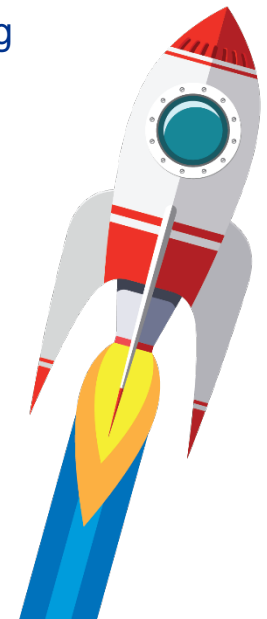
The IAASB firmly believes that further exploration of this topic is key. The DAWG will therefore continue its outreach, including, as appropriate, activities such as roundtables, both in-person and virtual, with for example a variety of firms to more fully understand current applications of data analytics, and to learn more about the firms' concerns and best practices. The DAWG will also consider how it can leverage the work of others in this area by reaching out to other groups who are also exploring the use of data analytics in a financial statement audit, for example, the DAWG intends to establish on-going interaction with the US Public Company Accounting Oversight Board (PCAOB), and will continue dialogue with the Data Analytics Project Advisory Panel.



The Way Forward

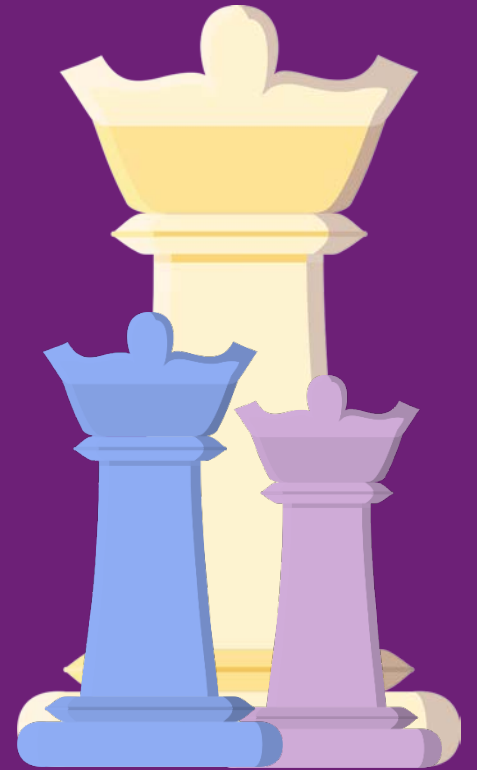
The DAWG will also refer the feedback received from respondents about other technologies whose impact on auditing deserves further consideration, such as block-chain technology, artificial intelligence, robots, etc., to the IAASB's Innovation Working Group. The objective of the Innovation Working Group is to explore emerging developments in the audit, assurance and related services fields for the purpose of assisting the IAASB in identifying opportunities for relevant and effective standard setting, or determining other potential actions, in a timely and informed manner, especially in light of the IAASB's development of its Strategy and Work Plan for 2020–2023.

Heeding the strong call for guidance from the respondents to the RFI, the DAWG has begun drafting examples and illustrations of the use of data analytics for inclusion in the application material of the IAASB standard-setting projects noted previously that are intended to illustrate how data analytics can be used in meeting the requirements of the auditing standards and enhancing audit quality.





The Core Elements of the Game



The new era



The Human Element – the essence of Deep Blue

Sometimes lost in all the talk about the potential benefits of cognitive technology is the fact that an audit professional still needs to be at the helm of the audit engagement.

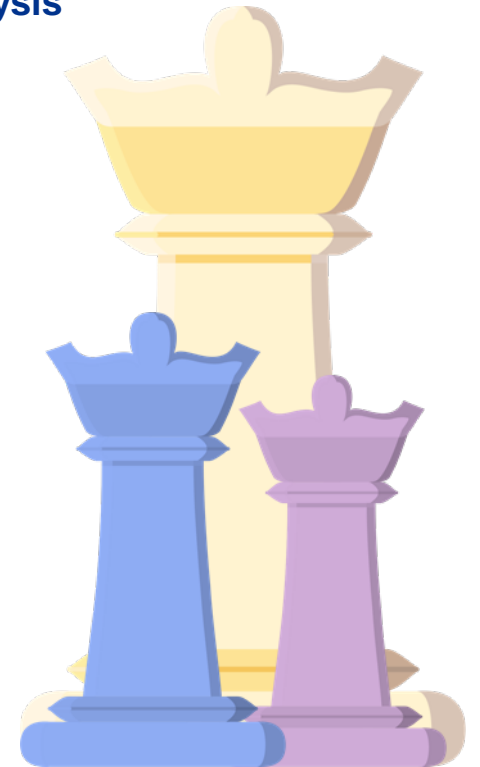
Cognitive technology and Analytics undoubtedly present an incredible and, eventually, an indispensable tool in the audit process.

But at the end of the day, it's the auditor who makes the critical decisions and offers the key analysis and insights in the audit of an organization's financial statements.

To use a chess analogy, many people may recall how in 1997, IBM's "Deep Blue" chess program beat then world champion Gary Kasparov in a six-game match. But far fewer know that more recently, when a person familiar with chess was teamed with a computer, the team consistently prevailed over another super computer – or expert chess player, for that matter – acting alone.

That's why we believe that "supervised cognitive" technology – the combination of cognitive capabilities with the skills and knowledge of audit professionals – will be the best approach to conducting an audit. The ability of cognitive technology to conduct analyses, draw insights and employ "learned judgment" will be a tremendous supplement to the auditor's decision making responsibility.

Because in the end, the auditor is the one who must make the final call on the audit opinion.

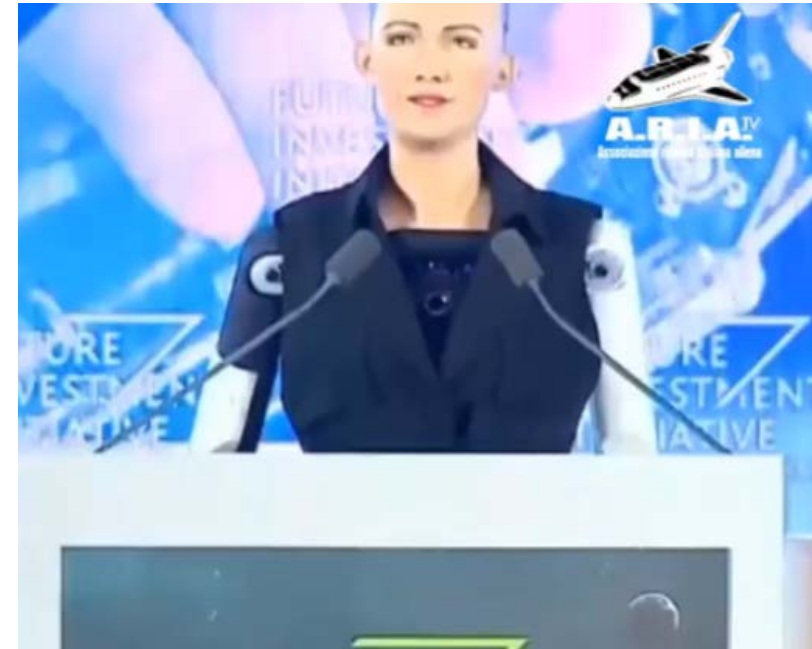


The Technology

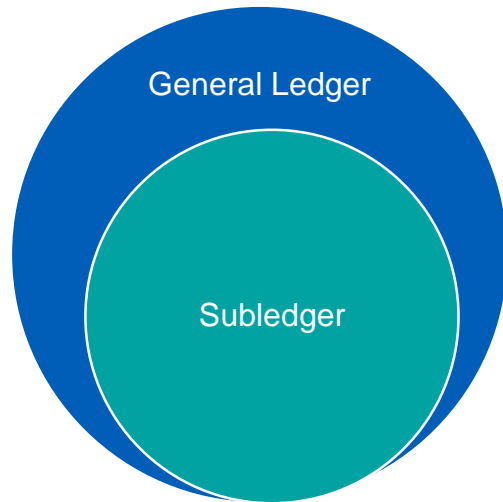
As part of KPMG's ongoing effort to stay on the leading- edge of technology, KPMG has entered into an exclusive partnering relationship with IBM Watson. (IBM Watson is the computer program that in 2011 defeated the two all-time top champions on the game show Jeopardy!). (IBM Watson has the capability to significantly enhance the amount of data our audit professionals can process as well as the quality of analysis and insight they can provide – both in terms of speed and depth", said O'Donnell. "We're investing in this innovative technology through relationships with IBM, Microsoft, and other leading IT companies because we know it represents the future of the audit profession".

"With cognitive technology we'll be able to offer our audit clients a more powerful value proposition – audits that are based on much larger, more complete data samples in the future – which in turn enable us to provide a high-quality audit as well as richer insights regarding business risks and performance," stated Swaminathan.

"Audit committees expect auditors to provide them and management with deep insights into a company's financial statement risk, business processes, and internal controls. We want our audit clients to know that an important by-product of our audit is the ability to generate insights that will provide long-term value to their business," stated Macaulay. "We believe that our audit professionals, supplemented by D&A and cognitive technology will be better able to accomplish that in the future."



How is DA used in the audit?



It helps to think of a company's financial information as being organized in layers.

The first, or top layer, is what we call the '**general ledger**', which is the primary bookkeeping system of a company.

Beneath the general ledger are more specific layers or **sub-ledgers**, such as around sales, purchases, inventory, etc.

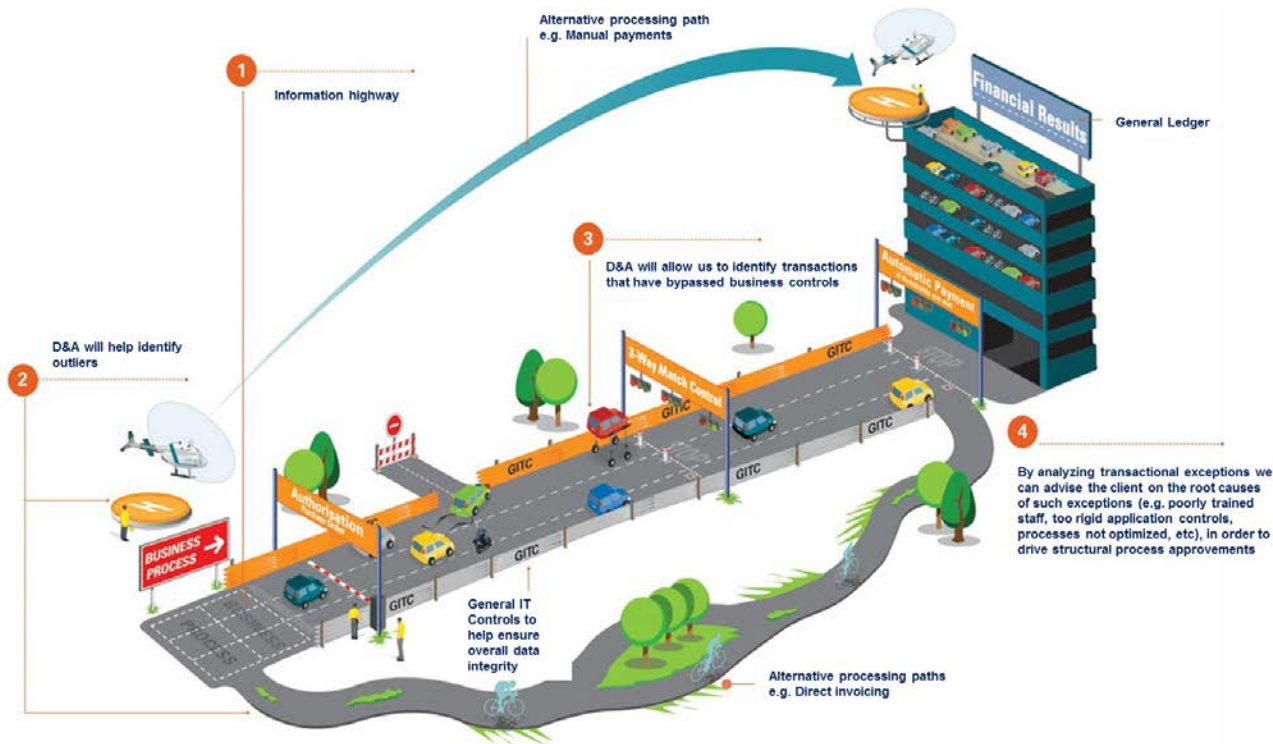
Using DA tools, we can start by analyzing the general ledger, running all the journal entries in the general ledger against accounting and audit rules and principles to assess the extent to which the contents of the ledger are in line with expectations or not.

This analysis enables us to be more precise in our initial risk assessment about the possibility of a material misstatement in the financial statements.

The analytics derived from the system almost 'talk' to the auditor, taking them through a series of qualitative risk-related data points throughout the sub-ledgers — enabling them to form their audit plan.

DA enables an auditor to work at greater levels of detail, which could result in better audit evidence. For example, with a company's revenue or sales, the auditor can analyze not just the postings in their financial management system, but the underlying documentation itself, such as actual invoices and bank feeds.

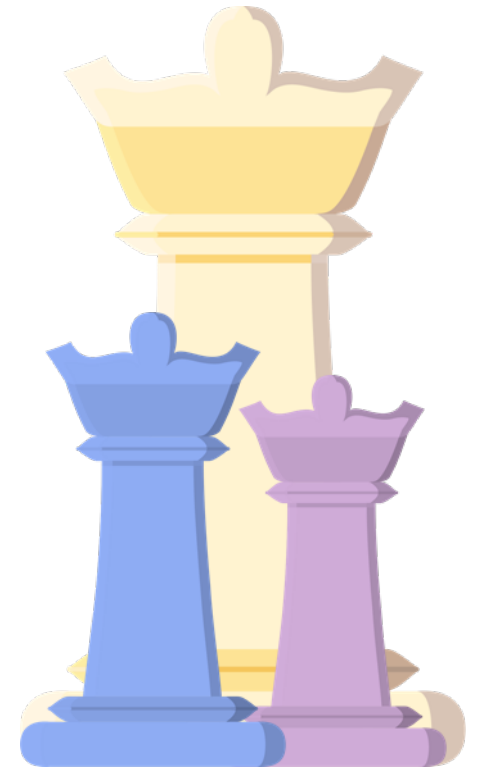
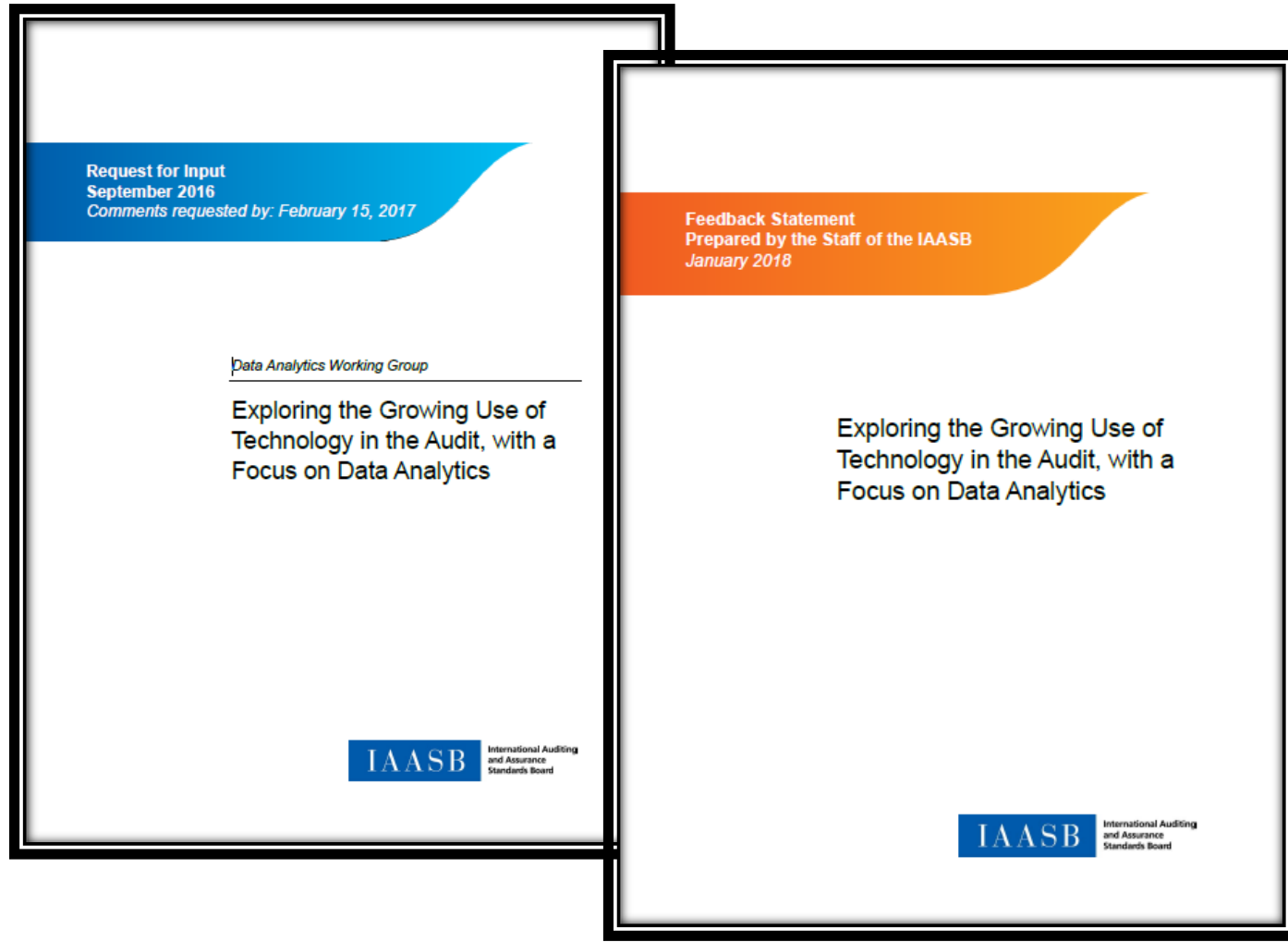
How to operate with Technology



Example for Purchase to Pay process

- 1 The highway is **the main route transactions take** through Customers system, passing through business process controls, kept safe by the GITC crash barriers, and ending up posted to the general ledger. For these transactions a largely control-based audit may be appropriate and efficient.
- 2 **Industry-specific data analytics** will help identify transactions that have not followed the well-controlled highway, so that we can focus our audit effort on the most significant exceptions.
- 3 Using data analytics will allow us to identify **transactions that have bypassed business controls**, e.g. the manual release of a blocked invoice.
- 4 By analyzing the transactional exceptions we can provide **insights to our customers about the root causes of such exceptions** (e.g. too rigid application controls, processes not optimized, etc.), in order to allow structural process improvements.

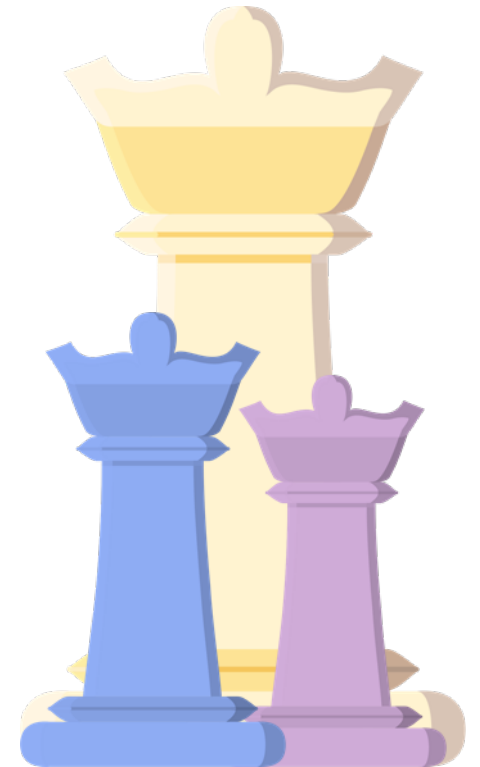
The Regulator and The Audit Standard Setter



The Market

Some constraints and requirements coming from the market:

- Audit quality
- Increase of insight
- Timely communication of issues
- Strong 'consultancy' over new business/regulatory requirements
- High technology experience and performance
- Constant fee reduction.





Additional Resources



Additional Resources

- Rutgers, Rutgers AICPA Data Analytics Research Initiative
- UK Financial Reporting Council's (FRC), The Use of Audit Data Analytics in an Audit of Financial Statements
- AICPA, Guide on Audit Data Analytics
- The Institute of Internal Auditors, Global Technology Audit Guide
- The World Bank/Centre for Financial Reform, Audit Data Analytics: Resources and Tips
- JICPA IT Committee Research Report No. 48, Outlook for IT-Based Auditing
- ACL's report 'White Paper, Best Practices for the Use of Data Analysis in Audits.





Thank you



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